

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Atty Dkt. 839-750

C# M#

IRWIN et al.

Group Art Unit: 2832

Serial No. 09/552,310

Examiner: Donovan

Filed: April 19, 2000

Date: December 22, 2003

Title: POWDER COATED GENERATOR FIELD COILS AND RELATED METHOD

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE/AMENDMENT/LETTER

This is a response/amendment/letter in the above-identified application and includes an attachment which is hereby incorporated by reference and the signature below serves as the signature to the attachment in the absence of any other signature thereon.

☐ **Correspondence Address Indication Form Attached.****Fees are attached as calculated below:**

Total effective claims after amendment 9 minus highest number
previously paid for 20 (at least 20) = 0 x \$ 18.00 \$ 0.00

Independent claims after amendment 3 minus highest number
previously paid for 3 (at least 3) = 0 x \$ 86.00 \$ 0.00

If proper multiple dependent claims now added for first time, add \$290.00 (ignore improper) \$ 0.00

Petition is hereby made to extend the current due date so as to cover the filing date of this
paper and attachment(s) (\$110.00/1 month; \$420.00/2 months; \$950.00/3 months) \$ 110.00

Terminal disclaimer enclosed, add \$ 110.00 \$ 0.00

☐ First/second submission after Final Rejection pursuant to 37 CFR 1.129(a) (\$770.00) \$ 0.00

☐ Please enter the previously unentered , filed

☐ Submission attached

Subtotal \$ 110.00

If "small entity," then enter half (1/2) of subtotal and subtract -\$ 0.00

☐ Applicant claims "small entity" status. ☐ Statement filed herewith

Rule 56 Information Disclosure Statement Filing Fee (\$180.00) \$ 0.00

Assignment Recording Fee (\$40.00) \$ 0.00

Other: 0.00

TOTAL FEE ENCLOSED \$ 110.00

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140. A duplicate copy of this sheet is attached.

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NIXON & VANDERHYE P.C.
By Atty: Michael J. Keenan, Reg. No. 32,106

Signature: 



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Atty. Ref.: 839-750; Confirmation No. 4131

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For: POWDER COATED GENERATOR FIELD COILS AND RELATED METHOD

* * * * *

December 22, 2003

Commissioner for Patents
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Alexandria, VA 22313-1450

Sir:

RESPONSE

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Responsive to the Official Action dated August 22, 2003, (for which petition is hereby made for a one month extension of time), applicant requests reconsideration for the reasons that follow.

The Examiner has rejected claims 1-9 and 18 under 35 U.S.C. 103 as unpatentable over Blaettner (U.S. 5,497,039) in view of Irwin et al. (U.S. 5,710,475) and Japan '606. According to the Examiner, Blaettner discloses the claimed invention except for a powder resin specifically having a dielectric strength of 1000 to 1500 v/mil for use in a turbine generator.

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In fact, Blaettner does not disclose the instant invention except for the powder resin coating. The Examiner refers to element 26 in Blaettner as a coil and apparently relies on that structure for providing response to the claimed windings. Applicant has repeatedly pointed out that the armature 26 is comprised of a rotor core 28 made up of a series of laminations 30, each of which includes a yoke portion 133 and a plurality of lamination teeth 134 extending radially away from the yoke. These lamination teeth define radial slots 128 between adjacent teeth as best seen in Figure 4B and Figure 5. After the core 28 and shaft 32 are assembled, magnet wire 125 is wound within the slots 128. In addition, Blaettner applies the insulating coating of epoxy resin 132 about the assembled group of laminations 30, shaft 32, and spacer 126. Not only is the coating not applied to the winding wire 126, but it is not even applied to substantially the entirety of each of the laminations 30. Note in this regard the dotted line configuration designated as the coating 132 in Figure 4A.

In terms of independent claim 1, Blaettner does not disclose or suggest a field coil comprised of multiple layers, each of the layers having a pair of ends connected by a pair of longitudinal sides that are adapted to be received within radial slots formed in an electromagnetic rotor. (Of course, the generally cylindrical core 28 of Blaettner is also not adapted to be received within radial slots formed in an electromagnetic rotor.) Thus, Blaettner does not disclose the claimed field coil construction as recited in the independent claims of this application. In addition, there is nothing in Blaettner to

suggest to one of ordinary skill in the art that the coating disclosure in this patent translates to the windings of a field coil.

The Examiner relies upon Japan '606 as disclosing a coating for a coil of an electric machine formed of a silicon powder resin having a "high" dielectric strength. Japan '606 discloses an impregnating material composition (also known as a VPI coating), and notes that the dielectric strength and the mechanical strength of the coil can be improved. The coating claimed in the instant application can be an epoxy resin or a hybrid mixture of silicon and epoxy resin (in powder form). The '606 reference insulation is a mixture of silicon resin, mica powder and inorganic fibers applied in slurry form with an organic solvent. The '606 reference thus discloses an impregnation process that is applied after the coil has been assembled into the armature.

In this regard, note the translation of the abstract in the '606 reference which states that:

To enhance the mechanical strength as well as the dielectric strength of the titled coil by a method wherein a solution, which is the mixture of silicon resin, mica powder of $44\mu\text{m}$ or below an average scale diameter and inorganic fibers of 0.5 mm or above in length which was diluted with an organic solvent, is impregnated and hardened on a coil whereon an insulated wire was wound around.

VPI coatings are generally considered more of an environmental coating and protectant for the underlying insulation layers which act as the primary insulation. Dielectric strength is a function of thickness, chemistry of the coating and the quality of the coating. Generally, VPI coatings are considerably thinner and coat all surfaces of the rotor or stator.

From a technical standpoint, use of the Japan '606 insulation which was formulated to facilitate its application via an impregnation process, would not be appropriate for the armature lamination surface insulation application discussed in Blaettner. In other words, one skilled in the art would have avoided the use of the Japan composition in the Blaettner insulation system design because they are not compatible.

In sum, the Japan '606 patent not only does not disclose the required structure recited in independent claim 1, but also, does not disclose or suggest a coating that covers substantially entirely each layer of a field coil for a generator electromagnetic rotor, much less a powder resin coating having a dielectric strength of at least 1000 v/mil and thermal stability above 155°C. as required by all of the independent claims 1, 9 and 18.

The Examiner now also relies upon the newly cited patent to Irwin as disclosing a generator having a winding with a high voltage power coating. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made that a coated winding with a power coating have a high dielectric strength could have been used in a generator, as suggested by Irwin et al., for the purpose of protecting the generator windings.

The tertiary reference to Irwin discloses the insulation of stator bars in turbine generators by coating with an insulating composition comprising a high temperature resistant thermoplastic resin such as a polyimide or a polyethersulfone. The coating is apparently applied by extrusion (see column 3).

The coating applied in Irwin is not a powder resin and, in addition, there is nothing in Irwin to suggest that the extruded coating has a dielectric strength of at least 1000 v/mil and a thermal stability above 155°C. as required by the independent claims of this application. Stator bar coatings are considerably thicker than coatings for rotor windings – due to the higher voltage and mechanical requirements. There is nothing in this patent that would have suggested the correct properties (compressive, mechanical, surface topography, surface friction and adhesive) for a rotor winding coating.

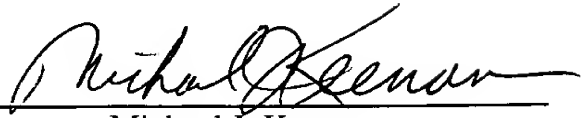
It is respectfully submitted that the references taken alone or in combination do not disclose or suggest the subject matter of independent claims 1, 9 and 18. In other words, even if the references were combined in the manner suggested by the Examiner, the claimed invention does not ensue. Moreover, and in any event, it would not have been obvious to modify the references in the manner suggested by the Examiner because that combination necessarily relies upon the impermissible use of hindsight gained from applicants' own disclosure.

For all of the above reasons, it is respectfully submitted that claims 1, 3-9 and 18 are in condition for immediate allowance, and early passage to issue is requested. In the event, however, any small matters remain outstanding, the Examiner is encouraged to telephone the undersigned in order to expedite the prosecution of the application.

IRWIN et al.
Appl. No. 09/552,310
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Respectfully submitted,

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